

(19) World Intellectual Property  
Organization  
International Bureau



(43) International Publication Date  
25 November 2004 (25.11.2004)

PCT

(10) International Publication Number  
**WO 2004/101014 A3**

(51) International Patent Classification<sup>7</sup>: **A61L 31/00**,  
C23C 14/08, A01N 59/16

(21) International Application Number:  
PCT/CA2004/000680

(22) International Filing Date: 6 May 2004 (06.05.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
2,428,922 16 May 2003 (16.05.2003) CA  
2,460,585 10 March 2004 (10.03.2004) CA

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(81) Designated States (*unless otherwise indicated, for every  
kind of national protection available*): AE, AG, AL, AM,  
AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN,  
CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,  
GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE,  
KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD,  
MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG,  
PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM,  
TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM,  
ZW.

(84) Designated States (*unless otherwise indicated, for every  
kind of regional protection available*): ARIPO (BW, GH,  
GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM,  
ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),  
European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI,  
FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI,  
SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ,  
GW, ML, MR, NE, SN, TD, TG).

Published:  
— with international search report

(88) Date of publication of the international search report:  
7 July 2005

*For two-letter codes and other abbreviations, refer to the "Guid-  
ance Notes on Codes and Abbreviations" appearing at the begin-  
ning of each regular issue of the PCT Gazette.*

(54) Title: DEPOSITION PRODUCTS, COMPOSITE MATERIALS AND PROCESSES FOR THE PRODUCTION THEREOF

(57) Abstract: Methods for the production of deposition products including an oxidized metal species under both acidic and alkaline conditions, methods for the production of composite materials including a substrate and the deposition product, and products in the nature of deposition products and composite materials. The methods are particularly suited for depositing a very thin layer of a deposition product on a substrate and may be used to produce composite materials for use in many applications, including but not limited to electronics, materials engineering and medical applications. In a preferred embodiment, the metal is silver, the substrates are medical devices or components of medical devices and the deposition product includes an antimicrobially active oxidized silver species.



**WO 2004/101014 A3**

# INTERNATIONAL SEARCH REPORT

International Application No  
PCT/CA2004/000680

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 A61L31/00 C23C14/08 A01N59/16

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 A61L C23C A01N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, CHEM ABS Data, WPI Data

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 6 426 195 B1 (ZHONG SHUDE ET AL) 30 July 2002 (2002-07-30) column 5, line 28 - column 6, line 58 abstract	11-33
A	EP 0 875 146 A (WESTAIM TECHNOLOGIES INC) 4 November 1998 (1998-11-04) page 6, lines 12-20; claims 4,14; example 18	11-33
P,A	DJOKIC S.: "Deposition of Silver Oxysalts and Their Antimicrobial Properties" J. OF THE ELECTROCHEMICAL SOCIETY, vol. 151, no. 6, 26 April 2004 (2004-04-26), pages C359-C364, XP002307721 page C361, right-hand column, paragraph 1 page C363, right-hand column, line 36 - page C364, left-hand column, line 38	11-33

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

\* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search

30 November 2004

Date of mailing of the international search report

22. 04. 2005

Name and mailing address of the ISA

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# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/CA2004/000680

## Box II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☒ Claims Nos.: 1-10  
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:  
see FURTHER INFORMATION sheet PCT/ISA/210
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:  
11-33, 76(partly), 84-87(partly)

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

## FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box II.2

Claims Nos.: 1-10

Present claim 1 relates to a method for producing a composite material wherein the deposition product is comprised of at least one oxidized species of a metal by contacting the substrate with ions of a metal in a basic environment (an oxidizing agent is not necessarily present); this refers to an extremely large number of possible methods. Support within the meaning of Article 6 PCT and/or disclosure within the meaning of Article 5 PCT is to be found, however, for only a very limited number of such methods, namely a) first contacting the substrate with a silver diamino complex in a first basic environment and b) second contacting the substrate with a second basic solution containing a strong alkali compound in order to produce the desired oxidized species of silver. In the present case, the claims so lack support, and the application so lacks disclosure, that a meaningful search over the whole of the claimed scope is impossible.

Independent of the above reasoning, present claim 1 relates to a method defined by reference to a desirable characteristic or property, namely a method for producing a composite material wherein the deposition product is comprised of at least one oxidized species of a metal. An attempt is made to define the method by reference to a result to be achieved. Again, this lack of clarity in the present case is such as to render a meaningful search over the whole of the claimed scope impossible.

Consequently, the search has been carried out for those parts of the claims which appear to be clear, supported and disclosed, namely those parts relating to the method of claim 11 as disclosed on page 29 lines 28-34.

The applicant's attention is drawn to the fact that claims relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure. If the application proceeds into the regional phase before the EPO, the applicant is reminded that a search may be carried out during examination before the EPO (see EPO Guideline C-VI, 8.5), should the problems which led to the Article 17(2) declaration be overcome.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 11-33, 76(partly), 84-87(partly)

A method for producing a composite material under alkaline conditions, and the medical device obtainable by this method.

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2. claims: 34-75, 77-83, 88-95

A method for producing a composite material under acidic conditions, and the medical device obtainable by this method.

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3. claims: 76(partly), 84-87 (partly)

A medical device comprised of an antimicrobially active oxidized silver species comprising any silver salt and any silver oxide.

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# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/CA2004/000680

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 6426195	B1	30-07-2002	NONE
EP 0875146	A	04-11-1998	
		US 5454886 A	03-10-1995
		US 5958440 A	28-09-1999
		US 5985308 A	16-11-1999
		EP 0875146 A1	04-11-1998
		SI 729302 T1	31-08-2000
		AT 190195 T	15-03-2000
		AT 221314 T	15-08-2002
		AU 1006299 A	15-04-1999
		AU 1006399 A	15-04-1999
		AU 703141 B2	18-03-1999
		AU 8055194 A	06-06-1995
		BR 9408225 A	26-08-1997
		CA 2136454 A1	19-05-1995
		CA 2136455 A1	19-05-1995
		WO 9513704 A1	26-05-1995
		CN 1140977 A ,C	22-01-1997
		DE 69423363 D1	13-04-2000
		DE 69423363 T2	07-09-2000
		DE 69431130 D1	05-09-2002
		DE 69431130 T2	13-03-2003
		DK 729302 T3	14-08-2000
		DK 875146 T3	18-11-2002
		EP 0729302 A1	04-09-1996
		ES 2145847 T3	16-07-2000
		ES 2181071 T3	16-02-2003
		GR 3033632 T3	31-10-2000
		HK 1012210 A1	24-08-2001
		HU 75526 A2	28-05-1997
		IL 111505 A	16-08-1998
		IL 123228 A	31-12-1999
		JP 9505112 T	20-05-1997
		NZ 275066 A	24-09-1998
		NZ 331329 A	28-02-2000
		NZ 331330 A	28-02-2000
		PL 314683 A1	16-09-1996
		PT 729302 T	30-06-2000
		PT 875146 T	31-12-2002
		RU 2167526 C2	27-05-2001
		SI 875146 T1	31-12-2002
		ZA 9409085 A	16-05-1996
		AU 731730 B2	05-04-2001
		SI 725061 T1	31-08-2000
		US 5503704 A	02-04-1996
		ZA 9409084 A	16-08-1996
		AU 731732 B2	05-04-2001
		CA 2136456 A1	19-05-1995
		US 6017553 A	25-01-2000
		US 5837275 A	17-11-1998
		ZA 9409086 A	16-08-1996